

***Botrychium paradoxum* W.H. Wagner**

two-spiked moonwort

Ophioglossaceae (Adder's Tongue Family)

Status: State Threatened, USFWS Species of Concern

Rank: G2S2

General Description: From Wagner and Wagner (1981): Leaf 4 inches tall, the stalk $<1/16$ to in diameter. Texture varying from delicately herbaceous to robust and fleshy, color glaucous. The sterile segment is absent, replaced by a second fertile segment. The two fertile segments $\frac{1}{4}$ to 1 inches tall, unequal, the shorter one $\frac{2}{3}$ the length of the longer one, to equal in length, erect and approximate to one another, nearly sessile to stalked, the stalks up to half the total fertile segment length. Fertile portion mainly linear in outline because the lateral branches are sessile or nearly so and short, usually only $1/16$ to $1/8$ inch long. Sporangia mostly 2 or 3 per lateral branch.

Identification Tips: Very distinct species with 2 sporophores and no trophophore (sterile photosynthetic segment).

Phenology: Sporophores are present June through August.

Range: Sporadic distribution from British Columbia to Saskatchewan, south to Washington and Utah.

Habitat: According to Croft et al. (1997), the species occurs in late seral western redcedar (*Thuja plicata*) forests on floodplains, stream terraces near perennial or intermittent streams, lower and midslopes, and compacted old roadbeds, as well as in early seral *Pinus contorta* associations in moist, grazed old homestead meadows. Elevation ranges from 2400 to 6400 feet.

Ecology: The taxon may be dependent upon associated endophytic fungi for mineral absorption and carbohydrate nutrition since the species is partially achlorophyllous (lacks chlorophyll) (Wagner and Wagner 1981).

State Status Comments: There are only 14 known occurrences in Washington, most with fewer than 10 plants. The species is rare throughout its range.

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Inventory Needs: The taxon is difficult to detect because the plants are often hidden under other vegetation. Inventory is needed in areas adjacent to known populations.

Threats and Management Concerns: Grazing and recreation (trampling and ORV use) are the greatest threats to the species in Washington.

Comments: This species is known to hybridize with *B. hesperium* to form *B. x watertonense* Wagner.

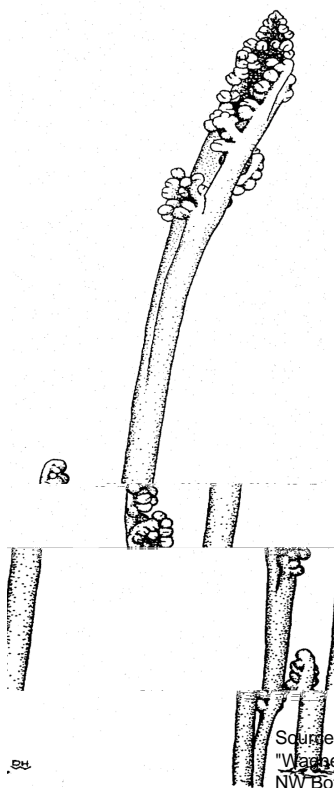
References:

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- Wagner, W.H. Jr., and F.S. Wagner. 1981. New species of moonworts, *Botrychium* subg. *Botrychium* (Ophioglossaceae), from North America. *Amer. Fern J.* 71(1): 20-30.
- Wagner, W.H. Jr., and F.S. Wagner. 1993. *Flora of North America, Volume 2: Pteridophytes and Gymnosperms*. Treatment of the Ophioglossaceae Family. pp. 85-106.

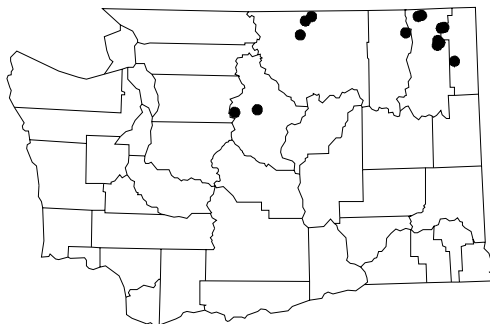
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Known distribution of
Botrychium paradoxum
in Washington



- Current (1980+)
- Historic (older than 1980)

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Photo by Kirk Larson, USFS



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